CLAIMS:

1. An air-cooling/tempering device for a glass plate which comprises:

a plurality of rollers for transferring a bend-shaped glass plate and for curving a transferring plane so as to correspond to a curved shape of the glass plate by being moved vertically;

a plurality of upper air-blowing heads each disposed at an upper side between each adjacent rollers to blow air to an upper face of the glass plate transferred by the plurality of rollers;

a plurality of lower air-blowing heads each disposed at a lower side between each adjacent rollers to blow air to a lower face of the glass plate transferred by the plurality of rollers; and

an air-blowing head moving mechanism for moving vertically the upper air-blowing heads and the lower air-blowing heads depending on a vertical position of the plurality of rollers in a state that the distance between an upper air-blowing head and the lower air-blowing head opposing the upper air-blowing head is kept to be constant.

2. The air-cooling/tempering device for a glass plate according to Claim 1, wherein the air-blowing head moving mechanism moves vertically the upper air-blowing heads and the lower air-blowing heads depending on an amount of movement in a height direction of an intermediate point

between adjacent rollers.

3. An air-cooling/tempering device for a glass plate which comprises:

a plurality of rollers disposed at predetermined intervals and supported by movable frames capable of moving vertically so as to move individually in a vertical direction to transfer a bend-shaped glass plate;

upper air-blowing heads each disposed at an upper side between each adjacent rollers to blow air to an upper face of the glass plate;

lower air-blowing heads each disposed at a lower side between each adjacent rollers to blow air to a lower face of the glass plate;

a plurality of upper supporting frames attached with the upper air-blowing heads and supported to be capable of sliding in a vertical direction;

a plurality of lower supporting frames attached with the lower air-blowing heads and supported to be capable of sliding in a vertical direction;

pivot shafts each provided on each of the movable frames;

disk-like pieces each provided on the same axis as the pivot shaft;

swing arms each disposed between adjacent pivot shafts so that an end is supported rotatably by a pivot shaft at one side and the other end is supported by the pivot shaft at the other side;

connecting arms each having an end connected to one of the lower supporting frames and the end connected to a central portion of one of the swing arms;

and driven arms each having an end connected to one of the upper supporting frames and the other end mounted on an upper face of a central portion of one of the swing arms, wherein the plurality of rollers at a position where the glass plate is transferred are moved vertically with the transfer of the glass plate so that a curved plane is formed in the transferring plane formed by the plurality of rollers at that position, the curved plane being curved in a transferring direction so as to correspond to the shape of the glass plate bend-shaped; each of the rollers are sequentially moved vertically with the transfer of the glass plate and the curved plane is shifted in the transferring direction of the glass plate with the transfer of the glass plate; and the upper air-blowing heads and the lower air-blowing heads each disposed between each adjacent rollers are moved vertically so as to correspond to the vertical movement of the glass plate to transfer the bend-shaped glass plate and at the same time, to blow air to the upper and lower faces of the glass plate to thereby air-cooing and tempering the glass plate.

4. The air-cooling/tempering device for a glass plate according to Claim 3, which further comprises upper supporting frame driving means each adapted to move

vertically each of the upper supporting frames and lower supporting frame driving means each adapted to move vertically each of the lower supporting frames wherein each of the connecting arms is connected to adjacent lower supporting frames via the lower supporting frame driving means.

5. The air-cooling/tempering device for a glass plate according to Claim 1, ~~2, 3 or 4,~~ wherein at an upstream side of the air-cooling/tempering device, there is located a glass plate bend-shaping apparatus for bend-shaping a glass plate to have a predetermined curvature, which comprises a heating furnace for heating the glass plate to a bend-shaping temperature, a roller conveyor provided at a downstream side of the heating furnace and having a plurality of shaping rollers for forming a transferring plane for transferring the glass plate, vertically moving means for moving in a vertical direction the plurality of shaping rollers and a control means for controlling the driving means so that by the plurality of rollers at the position where the glass plate is transferred, a desired curved plane curved in the transferring direction of the glass plate is formed in at least a portion of the transferring plane and the plurality of rollers are sequentially moved vertically with the transfer of the glass plate whereby the curved plane is shifted in the transferring direction of the glass plate.

6. An air-cooling/tempering method for a glass plate for air-cooling and tempering the glass plate by blowing air to an upper face and a lower face of the glass plate transferred sequentially by means of a transferring means through air-blowing heads disposed along the transferring means, which comprises:

using the air-blowing heads in which the air-blowing area is divided into a plurality of areas along a transferring direction of the transferring means;

a step of stopping the blowing of air in the air-blowing area at an uppermost stream side in the transferring direction from the beginning of the transfer of a portion of the glass plate into the air-blowing area at an uppermost stream side in the transferring direction in the air-blowing head to the transfer of the entirety of the glass plate;

a step of blowing air in the air-blowing area at the uppermost stream side in the transferring direction from the transfer of the entirety of the glass plate into the air-blowing area at the uppermost stream side in the transferring direction to the transfer of the glass plate to a downstream side of the air-blowing area at the uppermost stream side in the transferring direction; and

a step of stopping the blowing of air in the air-blowing area at the uppermost stream side in the transferring direction after the entirety of the glass plate has been transferred from the air-blowing area at the uppermost

stream side in the transferring direction.

7. The air-cooling/tempering method according to Claim 6, wherein the air-blowing head has an air-blowing area which is divided into a first area at an upper stream side in the transferring direction of the transferring means and a second area at a downstream side thereof, and wherein a step of blowing air in the first and second areas when the entirety of the glass plate is transferred into the first area, a step of stopping the blowing of air in the first area when the entirety of the glass plate is passed through the first area and a step of reopening the blowing of air in the first area when the next glass plate is transferred into the first area to which the blowing of air has been stopped, are repeated sequentially.

8. The air-cooling/tempering method according to Claim 6, wherein the air-blowing head has an air-blowing area which is divided into a plurality of areas along the transferring direction of the transferring means, and wherein a step of blowing air from all divided areas when the entirety of the glass plate is transferred into the air-blowing area of the air-blowing head, a step of stopping the blowing of air in the order of areas through which the glass plate is passed, a step of reopening the blowing of air from the all divided areas when the entirety of the next glass plate is transferred into the areas to which the blowing of air is stopped, and a step

of stopping the blowing of air in the order of areas through which the glass plate is passed, are repeated sequentially.

9. The air-cooling/tempering method according to Claim 6, wherein an air-blowing area in the air-blowing heads is divided into a plurality of areas along the transferring direction of the transferring means, and air is blown from only the air-blowing area of the area which corresponds to the position of the glass plate during the transfer when the entirety of the glass plate is transferred into the air-blowing area of the air-blowing head.

10. The air-cooling/tempering method according to Claim 6, wherein a plurality of tempering rollers are used as the transferring means; the plurality of tempering rollers at the position where the glass plate is transferred are moved vertically with the transfer of the glass plate so that a curved plane is formed in at least a portion of the transferring plane formed by the rollers at that position, the curved plane being in correspondence with a curved shape of the glass plate in the transferring direction of the glass plate; the plurality of tempering rollers are sequentially moved vertically with the transfer of the glass plate so that the curved plane is shifted in the transferring direction of the glass plate with the transfer of the glass plate, and a plurality of air-blowing heads in the air-blowing

head each disposed between adjacent tempering rollers is moved vertically so as to correspond to the vertical movement of each of the tempering rollers, whereby the glass plate is air-cooled and tempered.